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which, if we put c for n, is the same as equation (12) on page 155 of Vol. II., No. 9 of the *Mathematical Magazine*, and is an identity as will be found by performing the indicated operations and adding.

III. **Solution by BENJ. F. YANNEY, A. M., Professor of Mathematics in Mount Union College, Alliance, Ohio.**

Suppose the statement true : $x^3+(2x-3)^3+(nx-3n)^3=n^3x^3$.

Then, $x^3+8x^3-36x^2+54x-27+n^3x^3-9n^3x^2+27n^3x-27n^3=n^3x^3$.

Whence, $(x-1)(x^2-3x+3)-n^3(x^2-3x+3)=0$. Whence, $x-1-n^3=0$.

Whence, $n^3+1=x$, which is the hypothesis. ∴ The above supposition is true.

IV. **Solution by COOPER D. SCHMITT, A. M., Professor of Mathematics in the University of Tennessee, Knoxville, Tennessee.**

Performing the operations we have

$$x^3+8x^3-36x^2+54x-27+n^3x^3-9n^3x^2+27n^3x-27n^3, \text{ or}$$

$$9x^3-36x^2+54x-27+n^3x^3-9n^3x^2+27n^3(x-1), \text{ but } n^3=x-1\ ;$$

hence $9x^3-36x^2+54x-27+n^3x^3-9n^3x^2+27(x-1)^2$, which upon reduction gives

$$9x^3-9x^2-9n^3x^2+n^3x^3,=9x^3-9x^2-9x^2(x-1)+n^3x^3,$$

$$=9x^3-9x^2-9x^3+9x^2+n^3x_3,\ =n_3x_3.$$

Also solved by *J. H. DRUMMOND*, *M. A. GRUBER*, *J. SCHEFFER*, and *G. B. M. ZERR*.

39. **Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in Irving College, Mechanicsburg, Pennsylvania.**

The m^{th} root of the n^{th} power of an *integral* number is a perfect p^{th} power. What is the number ?

Solutions by J. H. DRUMMOND, LL. D., Portland, Maine ; M. A. GRUBER, A. M., Washington, D. C., and J. SCHEFFER, A. M., Hagerstown, Maryland.

Let $x^{1\div m}=a^p$, then $x=a^{pm}$, in which a may be any integral number : for the n^{th} power of a^{pm} must also be a p^{th} power. [J. H. DRUMMOND.]

Manifestly any whole number raised to the mp^{th} power.
[J. SCHEFFER.]

Let x=the integral number. Then $x^{n\div m}=a^p$. Raising to m^{th} power and extracting n^{th} root, we obtain $x=a^{mp\div n}$, or $\sqrt[n]{a^{mp}}$. ∴ The required integral number is the n^{th} root of the mp^{th} power of any integer, mp being a multiple of n.
[M. A. GRUBER.]

Also solved by *G. B. M. ZERR*.